

REMARKS

Claim 8 has been canceled, and claim 7 amended, upon entry of the amendments above. Claims 7 and 9-12 remain pending in the application.

Claim 7 has been amended to improve the clarity of the claimed subject matter and to bring the claims into conformity with U.S. Practice and format, and to place the application fully in condition for allowance.

Applicants have not yet received a copy of the Notice of Draftsperson's Patent Drawing Review PTO-948, and requests the same in the next Official Action. In the event that this document is not sent to the Applicants, it is assumed that the original drawings are acceptable.

CLAIM REJECTIONS

Claim Rejections under 35 U.S.C. § 102

Claims 7-12 are rejected under 35 U.S.C. § 102 as being anticipated by U.S. 6,047,470 (hereinafter Drussel et al.).

Applicants wish to direct the Examiner's attention to MPEP § 2131 which states that to anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed.Cir. 1990).

Claim 7 has been amended to incorporate the limitations set forth in claim 8 (claim 8 has been canceled) in order to clearly define the claimed invention and distinguish the claimed invention over the prior art, including Drussel et al. According to amended claim 7, the saw machine is positioned with respect to the first substrate area 110, 210 according to the alignment marks 111 along the longitudinal axis from one side of the substrate strip 100, 200 and cuts the substrate strip 100, 200 according to cutting tracks 101, 102 defined by the cutting marks 112 parallel to the lateral axis; then the saw machine is re-positioned with respect to the next/adjacent substrate area 110, 210 and then cuts the substrate strip 100, 200, whereby cutting error which results from the cutting of each substrate area 110, 210 will not accumulate to the subsequent or adjacent substrate areas 110, 210 in the substrate strip 100, 200.

In prior art devices, including Drussel et al., the saw machine is positioned only once with respect to the first substrate area according to the alignment mark 111 and then continues to cut subsequent or adjacent substrate areas on the substrate strip according to cutting tracks defined by the cutting marks, the saw machine was not re-positioned again with respect to the next or adjacent substrate area in order to make further cuts in the substrate strip, whereby cutting error results from each substrate area that is cut, and such cutting errors will be compounded each time a substrate area is cut.

The Examiner indicated that Drussel et al. discloses a process in which a strip 2 having a plurality of substrate areas, providing a plurality of alignment marks 44 (Figure 3C), providing a plurality of cutting marks 40 (Figure 3C), positioning the saw machine with respect to the substrate area (Figure 1), cutting each individual substrate areas (Figure 3A), a plurality of cutting tracks 28, 30 and at least two strips juxtaposed on a position shown in Figures 5 and 13, cutting the substrate strip according to the cutting tracks (Figure 6) and two substrate strips that are juxtaposed for cutting

simultaneously.

In Drussel et al., the openings 24 are defined in the circuit board substrate material 21 to separate each of the plurality of circuit board forming regions 25 from one another (column 7, lines 2-6). The singulation axes 28, 30 intersect through a first opening portion 42 and a second end opening portion 40 of each of the openings 24 separating the plurality of individual circuit board portions 22, respectively (column 7, lines 30-36). With the singulation axes 28, 30 intersecting end portions 40, 32 of each opening 24, removal of material along the respective singulation axes 28, 30 (i.e., that interconnect region 27, 29 of substrate material 21 lying at edges 36, 38) results in singulation of the circuit board substrate assembly 20 into respective individual circuit board portions 22. The removal of at least a portion of the interconnect substrate material 27, 29 between the openings 24 which separate adjacent pairs of individual circuit board portions 22 results in the plurality of singulated individual circuit board portions 22 (column 7, line 52 to column 8, line 3). Hence, the process taught by Drussel et al. is entirely different from the claimed invention and the opening portions 40, 42 of the openings 24 are not used as cutting marks for positioning any cut blade.

Further, the Drussel et al. reference does not teach, disclose or suggest the unique feature of the claimed invention for re-positioning the saw machine with respect to the next substrate area before cutting the substrate strip so as to eliminate the cutting error that results from the cutting of the previous substrate area such that the cutting error will not accumulate to the subsequent or adjacent substrate areas in the substrate strip. Therefore, the process of the claimed invention is distinctly different from that of the prior art, including Drussel et al.

In addition, comparing the substrate strip 100 of the claimed invention with the circuit board substrate assembly 20, 100 according to Drussel et al., the circuit board substrate 20, 100 of Drussel et al. may include any number of interconnected individual circuit board portions 122 that are interconnected by respective portions of peripheral

substrate material 123, 125 which extend between a first end 132 and a second end 134 of the circuit board substrate assembly 100 and are located inwardly from the respective edges 136 and 138 (column 6, line 60 to column 7, line 7).

Although there may appear to be similarities between the claimed invention and Drussel et al., there is no openings on the substrate strip 100 of the claimed invention and the at least opening 124 provided by the individual circuit board portions 122 of Drussel et al. is used to separate the circuit board portions 122 (column 6, lines 6-11). The alignment marks provided by the claimed substrate strip 100 are used to position the saw machine, but the openings 24, 124 and their opening portions 40, 42 of the circuit board substrate assembly 20, 100 of Drussel et al. that are used for separating adjacent pairs of individual circuit board portions 22, instead of positioning the saw machine with respect to the Drussel circuit board substrate assembly.

Furthermore, the Drussel et al. reference still does not disclose how the alignment holes 44 are used to position the saw machine to precisely cut the individual circuit boards. That is, although the circuit board substrate material 21 of Drussel et al. can be cut along the singulation axes 28, 30 by a saw machine, the cutting errors still will be accumulated to the subsequent or adjacent cutting processes in the substrate strip due to the absence of re-positioning process, particularly for simultaneously cutting a plurality of juxtaposed substrate strips.

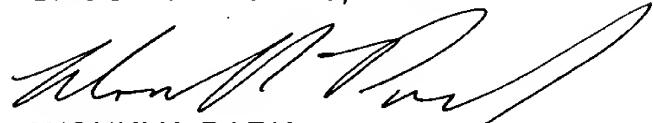
In view of the amendments, and the remarks above, withdrawal of the rejection is respectfully requested.

In summary, it is respectfully submitted that none of the prior art individually or collectively shows a process for sawing a substrate strip as claimed. Accordingly, withdrawal of the rejection of the claims appears to be warranted and the same is respectfully requested. In the event there are any outstanding matters remaining in the present application which can be resolved by a telephone call or facsimile communication to Applicants' Attorney, the Examiner is invited to contact the

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undersigned by telephone or facsimile at the numbers provided below.

Respectfully submitted,
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APPENDIX OF MARKED UP SPECIFICATION

Page 1, line 20 to Page 2, line 3, please amend this paragraph as follows:

The substrate strip 100 is packaged in high temperature circumstances and results in an expansion. When the substrate strip 100 returns to normal temperature, shrinkage in all dimensions occurs. However, each strip has variability which results in different amounts of shrinkage of the substrate strips 100 when returning from high temperature to normal temperature. Even if the substrate strips 100 are controlled in the same process and made of the same material, the shrinkage of the substrate strip 100 is still different. Therefore, each substrate strip 100 needs to be measured to define the cutting tracks in the first phase and the second phase. Then the saw machine detects the reference point of the alignment of the substrate areas 110 and moves to the predetermined position to cut the substrate strip 100 along the cutting tracks 101. Because the saw machine cuts the substrate strips 100 (which have different shrinkage) by the predetermined cutting tracks 101, the cutting error A of each substrate area 110 adds to the peripheral substrate areas 110 in all dimensions on the substrate strips 100, even though the cutting tracks are predetermined.

Page 2, between lines 3 and 4, please insert the following title centered in the middle of the page:

--Summary of the Invention--

Page 2, line 12, delete in its entirety, i.e., "Summary of the Invention".

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Page 2, lines 13-18, please amend this paragraph as follows:

The primary objective of this invention is to provide a substrate sawing process for a strip of substrate that includes multi-alignment so a sawing machine can be mechanically moved to the substrate areas and can be positioned by the corresponding alignments of each of the substrate areas to reduce the cutting error. Because the saw machine is positioned on each substrate areas by corresponding alignment, a cutting error in any of the substrate areas will not accumulate to the subsequent substrate areas or substrate strips.



APPENDIX OF MARKED UP CLAIM

7. (Amended) A process for sawing a substrate strip having a plurality of substrate areas by a saw machine, and the process comprising the steps of:

providing a plurality of alignment marks around each individual substrate area on the substrate strip;

providing a plurality of cutting marks around each individual substrate area on the substrate strip;

positioning the saw machine with respect to each individual substrate area in accordance with the alignment marks therearound; [and]

cutting each individual substrate area on the substrate strip by the saw machine respectively according to cutting tracks defined by the cutting marks;

wherein the substrate strip has a longitudinal axis and a lateral axis and the substrate areas are disposed along the longitudinal axis, the saw machine is positioned with respect to a first substrate area according to the alignment marks along the longitudinal axis from one side thereof and cuts the substrate strip according to cutting tracks defined by the cutting marks parallel to the lateral axis;

repositioning the saw machine with respect to an adjacent one of the substrate areas; and

cutting the substrate strip, whereby cutting error that results from each substrate area will not accumulate to the subsequent substrate areas in the substrate strip.